

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A gateway comprising:

a crossbar switching circuit having a plurality of input and output ("I/O") ports ;

a digital TV satellite receiver having an input for coupling to a satellite dish and an output for coupling to a first I/O port of said crossbar switching circuit;

an infrared or radio frequency receiver circuit for receiving commands and data from a wireless remote and coupled to a second I/O port of said crossbar switching circuit;

a ~~conventional~~ modem coupled to a third I/O port of said crossbar switching circuit and having a port for coupling to a ~~conventional~~ telephone line;

a decompression and conversion circuit having a ~~digital~~ data input coupled to a fourth I/O port of said crossbar switching circuit and having video and audio analog signal output ports and functioning to decompress digital video and audio data supplied by said crossbar switching circuit and convert said decompressed digital video and audio data into analog NTSC, PAL or SECAM video signals and audio signals at said video and audio analog signal output ports and to receive uncompressed ~~IP packet~~ data from said modem or said receiver and convert it to video and/or audio analog signals at said video and audio analog output ports, respectively;

a hard disk coupled to a fifth I/O port of said crossbar switching circuit; and

a computer coupled to ~~control signal inputs~~ a sixth I/O port of said crossbar switching circuit and ~~coupled~~ configured to send data to and receive data from said crossbar switching circuit, and programmed to control said crossbar switching circuit in accordance with commands received from a wireless remote control via said receiver circuit ~~to make the proper connections~~ to record digital video broadcast data on said hard disk in response to said command received from said wireless remote control ~~and/or convert said digital video broadcast data into analog~~

~~video and audio signals to drive said video and audio output ports for coupling to a conventional television or to supply IP packet data from said modem or receiver to said decompression and conversion circuit for conversion to video and/or audio signals at said video and audio output ports.~~

2. (Original) The apparatus of claim 1 wherein said gateway includes an MP3 server therein.

3. (Currently Amended) A gateway ~~that implements TIVO-like functions comprising:~~

a ~~router-switching-circuit~~ having a plurality of input and output ("I/O") ports;

a ~~digital TV satellite~~ receiver having an input for coupling to a satellite dish and an output for coupling to a first I/O port of said switching router circuit;

an infrared or radio frequency receiver circuit for receiving commands and data ~~from a wireless remote~~ and coupled to a second I/O port of said router switching circuit including commands to carry out one or more TIVO functions;

a ~~conventional~~ modem coupled to a third I/O port of said router switching circuit and having a port for coupling to a ~~conventional~~ telephone line;

a decompression and conversion circuit having a ~~digital~~ data input coupled to a fourth I/O port of said router-switching circuit and having video and audio analog signal output ports and functioning to decompress digital video and audio data supplied by said ~~router-switching-circuit~~ and convert said decompressed data into analog NTSC, PAL or SECAM video signals and audio signals at said video and audio analog signal output ports and to receive uncompressed ~~IP packet~~ data from said modem or said receiver and convert it to video and/or audio analog signals at said video and audio analog signal output ports, respectively;

a hard disk coupled to a fifth I/O port of said ~~router-switching~~ circuit; and

a computer coupled to ~~control signal inputs~~ a sixth I/O port of said ~~router-switching~~ circuit and coupled to send data to and receive data from said ~~router-switching~~ circuit, and programmed to control said ~~router-switching~~ circuit in accordance with commands received from a wireless remote control via said receiver circuit to ~~make the proper connections to record~~ digital video broadcast data on said hard disk and/or convert said digital video broadcast data into analog video and audio signals for displaying to drive said video and audio output ports for ~~coupling to a conventional television~~ or to supply IP packet data from said modem or receiver to said decompression and conversion circuit for conversion to video and/or audio signals at said ~~video and audio output ports~~, said ~~one or more computer~~ configured programs for controlling ~~said computer to control said satellite receiver, modem, switching circuit, hard disk and decompression and conversion circuitry~~ to download program guide data via said modem and to perform one of timed recording, simultaneous recording, pausing, rewinding, fast forwarding, and automatic recording functions in response to ~~carry out one or more TIVO functions requested~~ via wireless commands ~~received at said receiver~~ from ~~[[a]]~~ said wireless remote control.

4. (Currently Amended) A gateway coupled with that implements TIVO-like functions as well as interface one or more peripherals to at least two different broadband digital data transmission mediums, comprising:

a crossbar switching circuit having a plurality of input and output ("I/O") ports;

a digital TV satellite receiver having an input for coupling to a satellite dish and an output for coupling to a first I/O port of said crossbar switching circuit;

an infrared or radio frequency receiver circuit for receiving commands and data from a wireless remote and coupled to a second I/O port of said crossbar switching circuit including ~~commands to carry out one or more TIVO functions~~;

a ~~conventional~~ modem coupled to said crossbar switching circuit and having a port for coupling to a ~~conventional~~ telephone line;

a cable modem coupled to a third I/O port of said crossbar switching circuit;

a network interface circuit or bus driver coupled to a fourth I/O port of said crossbar switching circuit as well as to a port for connection to a local area network or external bus;

rate shaping circuitry coupled to a fifth I/O port of said crossbar switching circuit for altering the bandwidth of data routed through said rate shaping circuitry;

a decompression and conversion circuit having a digital data input coupled to a sixth I/O port of said crossbar switching circuit and having video and audio analog signal output ports and functioning to decompress digital video and audio data supplied by said crossbar switching circuit and convert said decompressed digital video and audio data into analog NTSC, PAL or SECAM-video signals and audio signals at said video and audio analog signal output ports and to receive uncompressed IP-packet data from said modem ~~or said receiver~~ and convert it to video and/or audio analog signals at said video and audio analog signal output ports, respectively;

a hard disk coupled to a seventh I/O port of said crossbar switching circuit; and

a computer coupled to ~~control signal inputs of an eighth I/O port of said crossbar~~ switching circuit and ~~configured coupled to~~ send data to and receive data from said crossbar switching circuit, and programmed to control said crossbar switching circuit in accordance with commands received from a wireless remote control ~~via said receiver circuit to make the proper connections to record digital video broadcast data on said hard disk and/or convert said digital video broadcast data into analog video and audio signals for displaying to drive said video and audio output ports for coupling to a conventional television or to supply IP-packet data from said conventional modem or receiver to said decompression and conversion circuit for converting conversion to video and/or audio signals at said video and audio output ports, said one or more computer programs for controlling said computer to control said satellite receiver, modem,~~

~~switching circuit, hard disk and decompression and conversion circuitry~~ configured to download program guide data via said modem and to perform one of timed recording, simultaneous recording, pausing, rewinding, fast forwarding, and automatic recording functions in response to ~~carry out one or more TIVO functions requested via wireless commands received at said receiver~~ from a wireless remote control, and/or to control said crossbar switching circuit to supply IP or MPEG format packet data from said cable modem to said network interface circuit or bus driver for output to one or more peripherals or to said decompression and conversion circuit for conversion to analog video and/or audio signals at said video and audio analog signal output port for display on a ~~conventional~~ television, and programmed to control said crossbar switching circuit to route selected data through said rate shaping circuitry and to control said rate shaping circuitry to alter the bandwidth of data routed therethrough.

5. (Currently Amended) A gateway ~~that implements TIVO-like functions as well as~~ configured to interface one or more peripherals to at least two different broadband digital data transmission mediums, comprising:

a crossbar switching circuit having a plurality of input and output ("I/O") ports;

a digital TV satellite receiver having an input for coupling to a satellite dish and an output for coupling to a first I/O port of said crossbar switching circuit;

an infrared or radio frequency transceiver circuit for exchanging commands and data with a wireless remote and coupled to a second I/O port of said crossbar switching circuit ~~said exchanging commands and data including exchanging of commands and data to carry out one or more TIVO functions and to display video images on said wireless remote;~~

a ~~conventional~~ modem coupled to a third I/O port of said crossbar switching circuit and having a port for coupling to a ~~conventional~~ telephone line;

high bandwidth digital data communication means coupled to a fourth I/O port of said crossbar switching circuit for exchanging data digitally at high data rate ~~between said gateway and a headend;~~

a network interface circuit or bus driver coupled to a fifth I/O port of said crossbar switching circuit ~~as well as to a port for connection~~ and coupled to a local area network or external bus;

a decompression and conversion circuit having a ~~digital data input~~ coupled to a sixth I/O port of said crossbar switching circuit and having video and audio analog signal output ports and functioning to decompress digital video and audio data supplied by said crossbar switching circuit and convert said decompressed data into analog NTSC, PAL or SECAM video signals and audio signals at said video and audio analog signal output ports and to receive ~~uncompressed IP packet~~ data from said modem or said receiver and convert it to video and/or audio analog signals at said video and audio analog signal output ports, respectively;

a hard disk coupled to a seventh I/O port of said crossbar switching circuit; and

a computer coupled to ~~control signal inputs of an eighth I/O port of said crossbar switching circuit~~ and ~~coupled~~ configured to send data to and receive data from said crossbar switching circuit, and programmed by one or more computer programs to control said crossbar switching circuit in accordance with commands received from a wireless remote control via said transceiver circuit to ~~make the proper connections to~~ record one or more programs encoded in digital video broadcast data on said hard disk either simultaneously or by timed recording in the future, and/or programmed to convert said digital video broadcast data into analog video and audio signals to drive said video and audio output ports for coupling to a ~~conventional~~ television, and programmed to control said crossbar switching circuit to supply IP packet data from said ~~conventional~~ modem or transceiver to said high bandwidth digital data communication means for transmission to a headend circuit to, ~~inter alia~~, request video programs, play games, etc., said one

or more computer programs for controlling said computer to control said satellite receiver, ~~conventional~~ modem and/or high bandwidth digital data communication means, said switching circuit, hard disk and decompression and conversion circuitry to implement one of timed recording, simultaneous recording, pausing, rewinding, fast forwarding, and automatic recording functions in response to TIVO functions in said gateway by downloading program guide data via said conventional modem or said high bandwidth digital data communication means and to carry out one or more other TIVO functions requested via wireless commands received at said receiver from a wireless remote control, and/or to control said crossbar switching circuit to supply IP or MPEG packet data from said high bandwidth digital data communication means or said satellite receiver or said conventional modem to said network interface circuit or bus transceiver for output to one or more peripherals coupled to said gateway via a local area network or external bus, or to supply said IP or MPEG packet data to said decompression and conversion circuit for conversion to analog video and/or audio signals at said video and audio output port for displaying on a conventional television, and programmed to control said crossbar switch to route selected data through said rate shaping circuitry and to control said rate shaping circuitry to alter the bandwidth of data routed therethrough to match the available bandwidth of whatever data path on which said data is to be transmitted.

6. (Currently Amended) The apparatus of claim 5 further comprising an MP3 server coupled to said crossbar switching circuit and controlled by said computer to supply MP3 data to said network interface circuit or bus transceiver for output to one or more peripherals coupled to said gateway via a local area network or external bus.

7. (Currently Amended) A gateway ~~that implements TIVO-like functions as well as interface one or more peripherals to at least one broadband digital data transmission mediums,~~ comprising:

one or more transceiver means for sending data to and receiving compressed video and/or ~~iData~~ data from a headend via one or more broadband, digital data transmission mediums,

one or more processing means coupled to said one or more transceiver means, for performing at least one of MPEG transport demultiplexing, video decoding, MPEG encoding, conditional access and decryption and rate shaping functions ~~as necessary depending upon the particular one or more types of transceiver means in use to generate digital video and iData from a headend having a data rate suitable for transmission~~ said data over a local area network ~~to the peripheral that requested said data and ready for packetization,~~ and for providing at least rate shaping data ~~to be transmitted to said headend prior to sending said data so said transceiver means such that said data has a data rate compatible with available upstream bandwidth to said headend awarded to said gateway;~~

one or more IP video means for encapsulating said video and iData from said headend received from said processing means into IP packets;

a packet switch/router having a plurality of input and output ("I/O") ports, wherein a first I/O port of said packet switch/router is coupled to said IP video means and a second I/O port of said packet switch/router is coupled to said processing means, for receiving data from said IP video means and routing said packets based upon data in routing tables to an appropriate destination and for receiving data packets addressed ~~[[to]]~~ from said headend and routing said packets to said headend via using said processing means and said transceiver means;

a ~~TIVO~~ server means coupled to a third I/O port of said packet switch/router for receiving commands requesting one or more TIVO functions and for implementing said TIVO functions by sending the appropriate menu or video data to said router for appropriate routing;

a DHCP server means coupled to a fourth I/O port of said packet switch/router for assigning IP addresses to client processes in said peripherals and said gateway;

a computer coupled to a fifth I/O port of said packet switch/router and programmed to receive commands and requests from peripherals coupled to said gateway and from said headend and to write data to said routing tables to control routing operations by said packet switch/router to cause requested data and commands to get to ~~[[the]]~~ an appropriate destination;

one or more local area network interface circuits (LAN NIC) ~~permanently or modularly~~ coupled to a sixth I/O port of said packet switch/router for sending data received from said packet switch/router to an appropriate peripheral coupled to said local area network interface circuit by a local area network transmission medium, and for receiving data and/or commands from a peripheral addressed to ~~said TIVO server~~ or a process at said headend and for passing said data and commands to said router for routing to the appropriate destination.

8. (Currently Amended) The apparatus of claim 7 further comprising a digital video disk player means coupled to a seventh I/O port of said packet switch/router for supplying video data stored on a DVD to said router for routing to said processing means, and wherein said processing means compresses said video data and supplies compressed data to said IP video means and wherein said IP video means encapsulates said compressed data into IP packets addressed to a peripheral that requested said DVD data and encapsulates said IP packets into LAN packets of the type used by said packet switch/router means addressed to the appropriate one or more of said LAN NIC coupled to the peripheral that requested said DVD data, and wherein said packet switch/router means routes said LAN packets to the appropriate LAN NIC for transmission over a local area network to the peripheral that requested said DVD data.

9. (Original) The apparatus of claim 7 wherein said computer is programmed by an e-mail application which controls said computer to receive email using a conventional modem or one of said transceiver means and a television and settop decoder coupled to one of said local area network interface circuits via a local area network for display of received e-mail and message composition schemes and to send e-mail using said television and settop decoder coupled to one of said local area network interface circuits via a local area network for displaying a message composition scheme and a wireless remote or wireless keyboard coupled to said gateway for entry of characters to be sent.

10. (Original) The apparatus of claim 7 wherein said gateway computer is programmed by a PBX application so as to provide voicemail capability and PBX functionality such that incoming calls from the public service telephone network can be routed to the telephone of the individual the caller is calling via a PSTN interface circuit, said packet switch/router, said computer, said local area network interface circuits and one or more local area networks and LAN adapters, or routed to a voicemail file stored on a hard disk coupled to said computer, said PBX application also controlling said computer so that outgoing calls can be made from conventional telephones coupled to said gateway via one or more local area networks and LAN adapters using said packet switch/router and a PSTN interface circuit.

11. (Currently Amended) The apparatus of claim 7 wherein said computer is further programmed by a PBX application so as to provide voicemail capability and PBX functionality such that incoming calls from the public service telephone network can be routed to the telephone of the individual the caller is calling via a PSTN interface circuit, said packet switch/router, said computer, one or more conventional tip and ring pairs and an interface circuit, or routed to a voicemail file stored on an area of a hard disk of said ~~TIVO~~ server means reserved

for voicemail messages, said PBX application also controlling said computer so that outgoing calls can be made from conventional telephones coupled to said gateway via one or more conventional tip and ring pairs and an interface circuit using said packet switch/router and a PSTN interface circuit.

12. (Original) The apparatus of claim 7 wherein said computer is further programmed with an HTTP web server program for controlling said computer to serve web pages to browsers browsing the internet via said packet switch/router and an interface means for interfacing to the internet to provide an always on connection to the internet.

13. (Original) The apparatus of claim 7 wherein said computer is further programmed with an answering machine program to control said computer to record messages for unanswered incoming telephone calls from a public service telephone network interface or a voice-over-IP channels.

14. (Original) The apparatus of claim 7 wherein further comprising a display coupled to a display adapter which is coupled to said packet switch/router and further comprising a keyboard or other input device coupled to an interface circuit which is coupled to said packet switch/router, said keyboard and display for controlling said gateway by issuing commands to said computer and displaying user interface data and/or command and/or program icons on said display, and wherein said packet switch/router and said local area network interface cards cooperate to allow any peripheral coupled by a LAN to any local area network interface card to communicate with any other peripheral coupled by a LAN to a different local area network interface card through said packet switch/router.